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EXAMINER

DHINGRA, RAKESH KUMAR

ART UNIT PAPER NUMBER

1763

DATE MAILED: 09/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/689,783

Applicant(s)

NGUYEN ET AL.

Examiner

Rakesh K. Dhingra

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/04, 9/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference numbers (s) mentioned in the description:

1) Reference number 124 (as mentioned in Paragraph 0035, line 9 is not shown in Figures 3 or 4.

2) Reference number 118 (as mentioned in Paragraph 0041, line 2) is not shown in Figure 7.

3) Reference number 418 (as mentioned in Paragraph 0050, line 2) is not shown in Figure 14.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informalities:

1) Paragraph.0020, line 1: it is suggested to change "the a substrate" to "the substrate";

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2) Paragraph 0037, line 1: it is suggested to add "Referring to Figure 5" in this line since the description in this paragraph pertains to Figure 5;

3) Paragraph 0037, line 6: it is suggested to delete "mate";

4) Paragraph 0043: it is suggested to rephrase the first sentence " Figure 8 is a -----in a processing position" to clarify its meaning;

5) Paragraph 0048, line 6: it is suggested to change "adapted receive" to "adapted to receive";

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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**Claims 1, 5-9, 12, 13, 17-21, 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent No. 6,537,011) in view of Stevens et al (US Patent No. 5,632,873) and Takagi (US Patent No. 6,679,759).**

Regarding Claims 1, 13, 24: Wang et al teach a substrate processing apparatus (Figure 18, Column 10, lines 1-35) for supporting and processing a substrate 222 comprising: transfer chamber 414;

a plurality of processing chambers 412;

having a pedestal 100 in a process chamber 160 defining a processing region and the pedestal 100 comprises (Figures 1, 2):

a lower pedestal (cover ring) 116 comprising a lower mounting plate (base) 119 having an upper body (upper surface) 121 with raised surfaces 118 and substrate supporting ridge 125 disposed around the upper body 121;

a support ring (capture ring) 120 disposed on the lower pedestal (cover ring) 116, the support ring (capture ring) comprising a base plate (ring) 202 ring having an opening (inner perimeter) 206 and one or more second substrate support members 204 a-204d around the opening 206 are adapted to receive a substrate, wherein the support ring (capture ring) 120 is adapted to mate with the lower pedestal (cover ring) 116 and form one contiguous raised surface 121 on the cover ring (Column 5, lines 10-65).

loadlock chamber 416 (Figure 18);

substrate handler 300

Wang et al do not teach bore in the lower pedestal (cover ring) 116

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and the support ring (capture ring) 120 having semi-circular shape.

Stevens et al teach an apparatus (Figures 2-7) for supporting substrate having a two ring structure that has an annular outer ring (capture ring) 12 with spacer 36 to clamp the substrate and an inner ring (cover ring) 11 with a bore and inwardly extending portions 54 that may contact substrate (Column 8, line 3 through Column 9, line 13).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a two ring structure with a cover ring having a bore as taught by Stevens et al in the apparatus of Wang et al to minimize damage to substrate which adhere to ring assembly.

Further Takagi teaches an wafer support device (Figures 1,2) that uses a susceptor 22 having a groove 30 to support a wafer and a semi-circular lift ring 32 with supports 36 to support the wafer when being transported on to the susceptor 22 (Column 3, line 11 to Column 4, line 48).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a capture ring of semi-circular shape as taught by Takagi in the apparatus of Wang et al and Stevens et al to facilitate easy access of the external robot blade during insertion and retrieval of wafer during the processing of wafers.

Regarding Claims 5,17, 28: Wang et al in view of Stevens et al and Takagi teach that one or more second substrate support members 204a-d of the support ring (capture ring) 120 are disposed on opposite sides of the inner perimeter of opening 206 (Wang et al, Figure 2).

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Regarding Claims 6, 18, 29: Wang et al in view of Stevens et al and Takagi teach that one or more first and second substrate support members 204 a-d comprise an upper portion 212, a lower portion 216, and at least a partial tapered portion 214 disposed between the upper portion and lower portion (Wang et al, Figure 5 and Column 6, lines 30-40).

Regarding Claims 7, 8, 19, 30: Wang et al in view of Stevens and Takagi teach that the lower surface 216 has an inclined surface between 2 to 7 degrees (includes 2.5 degrees) [Wang et al, Column 6, lines 44-50].

Regarding Claims 9, 21, 32: Wang et al in view of Stevens and Takagi teach that the lower pedestal (cover ring) 16 has one or more recesses 117 to receive plurality of lift pins 114 (Wang et al, Figure 2 and Column 5, lines 30-35).

Regarding Claim 12: Wang et al in view of Stevens et al and Takagi teach that the lower support (cover ring) 116 is adapted to be mounted on temperature control member (pedestal) 110 (Figure 2 and Column 4, lines 50-68).

Regarding Claims 20, 31: Wang et al teach that the temperature controlled base (pedestal) 110 comprises one or more lift pins 114 for vertically displacing the whole assembly [includes lower pedestal (cover ring) 116] {Column 5, lines 50-54}.

**Claims 2-4, 14-16, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent No. 6,537,011) in view of Stevens et al (US Patent No. 5,632,873) and Takagi (US Patent No. 6,679,759) as applied to Claims 1, 13, 25 and further in view of Warner et al (US Patent No. 2,639,392).**

Regarding Claims 2,14, 25: Wang et al in view of Stevens et al and Takagi teach all limitations of the claim including that one or more raised surfaces on the lower pedestal (cover ring) 116 disposed adjacent the bore comprise a first and second raised surfaces 118 with the first raised surface 118 comprising a linear raised surface extending a length of one side of the bore (Wang et al, Figure 2) and the inner perimeter of the raised surface 118 conforming to one or more sides of the bore.

Wang et al in view of Stevens et al and Takagi do not teach second raised surface comprising an arcuate shape.

Warner et al teach an apparatus for holding substrate (Figures 1, 2, 3) that has a masking plate 16 having a raised arcuate shaped surface 21 to support the crystal (substrate) [Column 4, lines 5-30].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a cover ring with a raised surface of arcuate shape as taught by Warner et al in the apparatus of Wang et al in view of Stevens et al and Takagi to provide a shoulder to support the substrate.

Regarding Claims 3,15, 26: Wang et al in view of Stevens et al and Takagi teach that the bore 206 is a rectangular shape (Figures 2, 3) and the one or more raised surfaces 118 are disposed on at least opposing sides of the bore 206 (Column 5, line 10 to Column 6, line 20).

Regarding Claims 4,16, 27: Wang et al in view of Stevens et al and Takagi teach that the first raised surface 118 is disposed substantially on one side of the bore and the



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second raised surface 118 is disposed on the opposite side and partially disposed on two adjacent edges (Figure 2, Column 5, line 10 to Column 6, line 20).

**Claims 10, 11, 22, 23, 33, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent No. 6,537,011) in view of Stevens et al (US Patent No. 5,632,873) and Takagi (US Patent No. 6,679,759) as applied to Claims, 1, 13, 25 and further in view of Roderick et al (US Patent No. 6,074,488).**

Regarding Claims 10, 11, 22, 23, 33, 34: Wang et al in view of Stevens et al and Takagi teach all limitations of the claim including that the support ring (capture ring) 120 is made from etch resistant material like Aluminium oxide (Column 6, lines 53-60).

Wang et al in view of Stevens et al and Takagi do not teach cover ring made of etch resistant material, Aluminium Oxide.

Roderick et al teach an apparatus 200 for supporting a substrate 50 that uses a collar ring (cover ring) 230 for supporting the substrate and is made from Aluminium oxide (Column 8, lines 35-40), which is an etch resistant material as taught by Wang et al 1 (as explained above).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use cover ring made from etch resistant material that is Aluminium oxide as taught by Roderick et al in the apparatus of Wang et al in view of Stevens et al and Takagi to provide more durability of the cover ring in the plasma etch environment.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

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**Aggarwal et al (US Patent No. 6,776,849)** teach a wafer holder apparatus (Figure 4) that includes a vertically moving lift ring 54 configured to support the bottom peripheral surface of wafer 16 and an inner plug 56 having a top flat surface configured to support the wafer during wafer processing.

**Yudovsky et al (US Patent No. 6,589,352)** teach an apparatus that has a substrate support 13 (Figures 1,10) with a purge ring 15 attached to substrate support 13 that engages with a shadow ring 4 and additionally a wafer W that rests on surface 13a of the substrate support.

**Sherstinsky et al (US Patent No. 5,673,922)** teach an apparatus (Figure 5, 6, 7) that includes a substrate support member 18 and an alignment member that has an alignment face 60, which urges a substrate 8 into alignment with the substrate receiving face of the support member 18.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rakesh Dhingra



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Art Unit 1763